



west virginia department of environmental protection

Office of Oil and Gas
601 57th Street SE
Charleston, WV 25304
(304) 926-0450
(304) 926-0452 fax

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

June 16, 2014

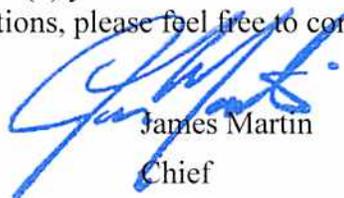
WELL WORK PERMIT
Horizontal 6A Well

This permit, API Well Number: 47-10303006, issued to GASTAR EXPLORATION INC., is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to all conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas inspector.

Please be advised that form WR-35, Well Operators Report of Well Work is to be submitted to this office within 90 days completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

In addition to the applicable requirements of this permit, and the statutes and rules governing oil and gas activity in WV, this permit may contain specific conditions which must be followed. Permit conditions are attached to this cover letter.

Per 35CSR-4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions, please feel free to contact me at (304) 926-0499 ext. 1654.



James Martin
Chief

Operator's Well No: LACKAWANNA NO U-3H
Farm Name: M.B. INVESTMENTS
API Well Number: 47-10303006
Permit Type: Horizontal 6A Well
Date Issued: 06/16/2014

Promoting a healthy environment.

PERMIT CONDITIONS

West Virginia Code § 22-6A-8(d) allows the Office of Oil and Gas to place specific conditions upon this permit. Permit conditions have the same effect as law. Failure to adhere to the specified permit conditions may result in enforcement action.

CONDITIONS

1. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACE). Through this permit, you are hereby being advised to consult with USACE regarding this proposed activity.
2. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than fifty (50) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
3. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the moisture content of the fill material shall be within limits as determined by the Standard Proctor Density test of the actual soils used in specific engineered fill, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort, to achieve 95 % compaction of the optimum density. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.
4. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.
5. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled *Water Well Regulations*, 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.
6. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.
7. If any explosion or other accident causing loss of life or serious personal injury occurs in or about a well or well work on a well, the well operator or its contractor shall give notice, stating the particulars of the explosion or accident, to the oil and gas inspector and the Chief, within 24 hours of said accident.
8. During the casing and cementing process, in the event cement does not return to the surface, the oil and gas inspector shall be notified within 24 hours.
9. Operator shall provide the Office of Oil & Gas notification of the date that drilling commenced on this well. Such notice shall be provided by sending an email to DEPOOGNotify@wv.gov within 30 days of commencement of drilling.



west virginia department of environmental protection

Oil and Gas Conservation Commission
601 57th Street, SE Charleston, WV 25304
(304)926-0499, Ext 1656

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
dep.wv.org

June 10, 2014

Department of Environmental Protection
Office of Oil and Gas
Charleston, WV 25304

RE: Application for Deep Well Permit – API #47-103-03006

COMPANY: Gastar Exploration, Inc.

FARM: M B Investments – Lackawanna #U-3H

COUNTY: Wetzel DISTRICT: Magnolia QUAD: Porters Falls

The deep well review of the application for the above company is **APPROVED FOR TRENTON – for Point Pleasant completion.** If operator wishes to drill deeper than the Trenton, additional approval must be obtained from the OGCC.

The applicant has complied with the provision of Chapter 22C-9, of the Code of West Virginia, nineteen hundred and thirty-one (1931), as amended, Oil and Gas Conservation Commission as follows:

1. Notice of Deviation comments filed? None
2. Provided a certified copy of duly acknowledged and recorded consent and easement form from all surface owners; Yes
3. Provided a tabulation of all deep wells within one mile of the proposed location, including the API number of all deep wells, well name, and the name and address of the operator; none
4. Provided a plat showing that the proposed location is a distance of 400+ feet from the nearest lease line or unit boundary and showing the following wells drilled to or capable of producing from the objective formation within 3,000 feet of the proposed location.

Sincerely,

Cindy Raines
Executive Assistant

WW-6B
(9/13)

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WELL WORK PERMIT APPLICATION

1) Well Operator: Gastar Exploration Inc. 494487685 Wetzel Magnolia Porters Falls 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: U-3H Well Pad Name: Lackawanna

3) Farm Name/Surface Owner: M.B. Investments Public Road Access: County Route 30 Whiteman Hill Road

4) Elevation, current ground: 1326' Elevation, proposed post-construction: 1302'

5) Well Type (a) Gas Oil Underground Storage

Other

(b) If Gas Shallow Deep

Horizontal

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):

The Point Pleasant is the target formation at a depth of 10,912' (top of formation), an anticipated thickness of 100' and an estimated pressure of 8200 psi.

8) Proposed Total Vertical Depth: 11,097'

9) Formation at Total Vertical Depth: Trenton Limestone

10) Proposed Total Measured Depth: 17,617'

11) Proposed Horizontal Leg Length: 6124'

12) Approximate Fresh Water Strata Depths: Shallowest at 70' & deepest at 1225'.

13) Method to Determine Fresh Water Depths: Noticeable flow at flowline or when needed to start soaping

14) Approximate Saltwater Depths: 1740'

15) Approximate Coal Seam Depths: Sewickley at 1079' and Pittsburgh at 1220'

16) Approximate Depth to Possible Void (coal mine, karst, other): None Anticipated

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes No

(a) If Yes, provide Mine Info: Name: _____
Depth: _____
Seam: _____
Owner: _____

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Environmental Protection

WW-6B
(9/13)

18)

CASING AND TUBING PROGRAM

<u>TYPE</u>	<u>Size</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft. (lb/ft)</u>	<u>FOOTAGE: For Drilling</u>	<u>INTERVALS: Left in Well</u>	<u>CEMENT: Fill-up (Cu. Ft.)</u>
Conductor	26"	New	PE	85.68 #/ft		40'	49 ft ³ (CTS)
Fresh Water	20"	New	H-40	94 #/ft		1275'	1224 ft ³ (CTS)
Coal	13 3/8"	New	J-55	61 #/ft		2650'	1841 ft ³ (CTS)
Intermediate	9 5/8"	New	HCP-110	47 #/ft		10,100'	3163 ft ³ (CTS)
Production	5 1/2"	New	P-110	23 #/ft		17,617'	4036 ft ³ (CTS)
Tubing	2 3/8"	New	N-80	4.7 #/ft		10,913'	N/A
Liners							

DH
4-30-14

<u>TYPE</u>	<u>Size</u>	<u>Wellbore Diameter</u>	<u>Wall Thickness</u>	<u>Burst Pressure</u>	<u>Cement Type</u>	<u>Cement Yield (cu. ft./k)</u>
Conductor	26"	30"	.312"	740 psi	See #24	1.21
Fresh Water	20"	24"	.33"	1530 psi	See #24	1.21
Coal	13 3/8"	17.5"	.4285"	3090 psi	See #24	1.2
Intermediate	9 5/8"	12.25"	.472"	9440 psi	See #24	1.32 & 1.18
Production	5.5"	8 1/2"	.4775"	13,580 psi	See #24	1.21
Tubing	2 3/8"		.19	11,200 psi		
Liners						

PACKERS

Kind:	N/A			
Sizes:	N/A			
Depths Set:	N/A			

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WW-6B
(9/13)

19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drill through the Point Pleasant tagging less than One Hundred (100') feet from the top of the Trenton Limestone to get depths and log data. Then, set a solid cement plug from TD (11,097') to proposed kick off point (10,570'). Drill the curve and horizontal section to planned and proposed TD (17,617'). Run casing and cement. Run a bond log on part of the curve and vertical section, pressure test casing and set a master valve. Prep the well for stimulation.

DmH
4-30-14

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

Gastar Exploration plans to fracture the well using a typical slickwater fracture design. Gastar will pump roughly 8000 bbls of water and 400,000 lbs of sand per stage. There will be approximately 31 stages.

Anticipated maximum surface pressure while fracing will be approximately 12,500 psi with an anticipated maximum rate of 90 bbls/min.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 25.45

22) Area to be disturbed for well pad only, less access road (acres): 4.01

23) Describe centralizer placement for each casing string:

Gastar will run 3 Centralizers on the Surface casing (20" casing) at an equal distance apart. The Intermediate casing (13 3/8" casing) will have 7 Centralizers at 300' spacing. The second Intermediate casing (9 5/8" casing) will have 40 Centralizers at 260' spacing. The production casing will have one centralizer every joint in the lateral, one centralizer per joint through the curve and one centralizer every third joint in the the vertical section 1500' inside of the 9 5/8" casing.

24) Describe all cement additives associated with each cement type:

See attached.

25) Proposed borehole conditioning procedures:

Gastar will circulate the hole a minnimum of 3 hours upon TD. We will then pull out to the bottom of the curve and circulate for another 2 hours. Then come out of the hole.

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*Note: Attach additional sheets as needed.

WW6B Attachment (2nd Revision for #24)

#24. Conductor and Surface Casing Cement: Class A + 2% CaCl

-CaCl – Calcium Chloride

Intermediate Casing: Class A + 1% EC-1 + .5% SMS + .55%BA-10A + .25#/sack Cello Flake + .75 gals/100 sacks FP-12L.

-EC-1 – Bonding Agent

-SMS – Sodium Metasilicate

-BA-10A – Bonding Agent

-Cello Flake – Cellophane Flakes

-FP-12L – Foam Preventer

Intermediate Casing #2: Lead Cement – 50:50 (Poz:Class A) + .15% R-3 + 3.9% KCl + 1.5% FL-25 + .2% ASA-301 + .75 gals/100 sack FP-12L

-R-3 – Retarder

-KCl – Potassium Chloride

-FL-25 – Fluid Loss

-ASA-301 – Free Water Additive

-FP-12L – Foam Preventer

Intermediate #2 Tail Cement – 50:50 (Poz:ClassH) + .1% R-3 + .2% CD-32 + 1.2% FL-62 + .1% ASA-301 + .4% SMS

-R-3 – Retarder

-CD-32 – Cement Dispersant

-FL-62 – Fluid Loss

-ASA-301 – Free Water Additive

-SMS – Sodium Metasilicate

Kick Off Plug Cement: Class H + .3% R-3 + .7% SMS + 1% CD-32

-R-3 – Retarder

-SMS – Sodium Metasilicate

-CD-32 – Cement Dispersant

Production Casing Cement: 50:50 (Poz:Class H) + .25% MPA-170 + 3 #/sack BA-90 + .35% R-3 + .75 gal/100 sacks FP-12L

-BA-90 – Bonding Agent

-R-3 – Retarder

-FP-12L – Foam Preventer

*PMH
4-30-14*

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MAY 08 2014

WV Department of
Environmental Protection

471030306



GASTAR EXPLORATION USA, INC.

Location: Wetzel County, WV
 Field: Wetzel
 Facility: Lackawanna Unit Pad

Slot: Slot #3U
 Well: Lackawanna Unit U-3H
 Wellbore: Lackawanna Unit U-3H (PWB)



Well Profile Data

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
Tie On	13.00	0.000	36.076	13.00	0.00	0.00	0.00	0.00
KOP	7000.00	0.000	36.076	7000.00	0.00	0.00	0.00	0.00
End of Build	7523.06	15.692	36.076	7516.54	57.53	41.91	3.00	34.48
End of Tangent	10570.48	15.692	36.076	10450.39	723.68	527.26	0.00	433.73
LP	11493.31	90.600	335.050	10987.25	1358.05	379.25	9.00	1071.34
BHL	17617.31	90.600	335.050	10923.12	6910.24	-2203.88	0.00	7195.00

Plot reference wellpath is Lackawanna Unit U-3H EX-02

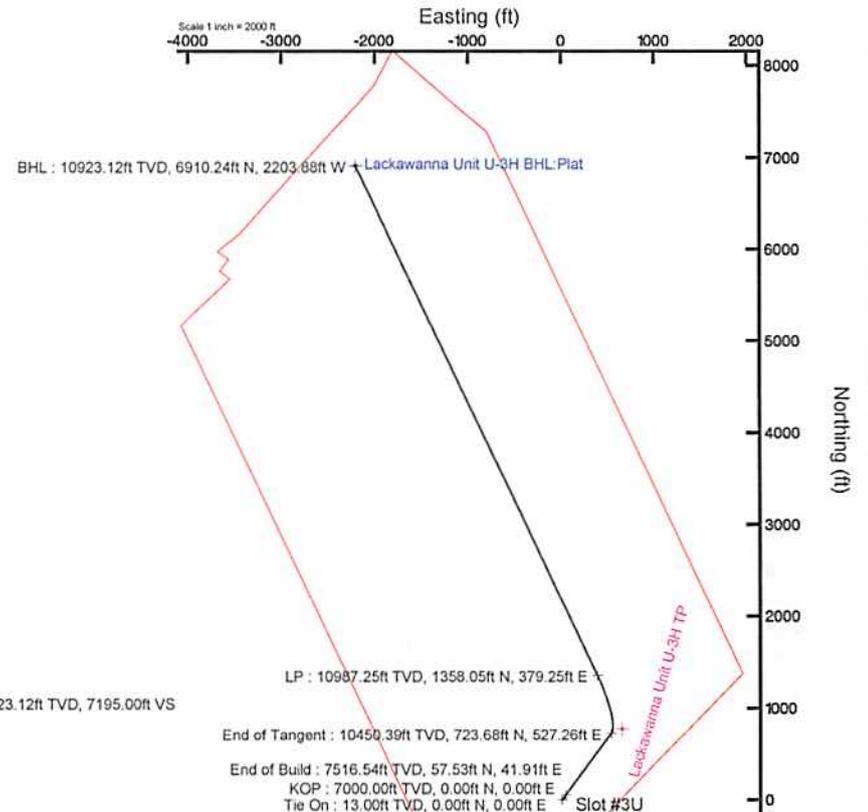
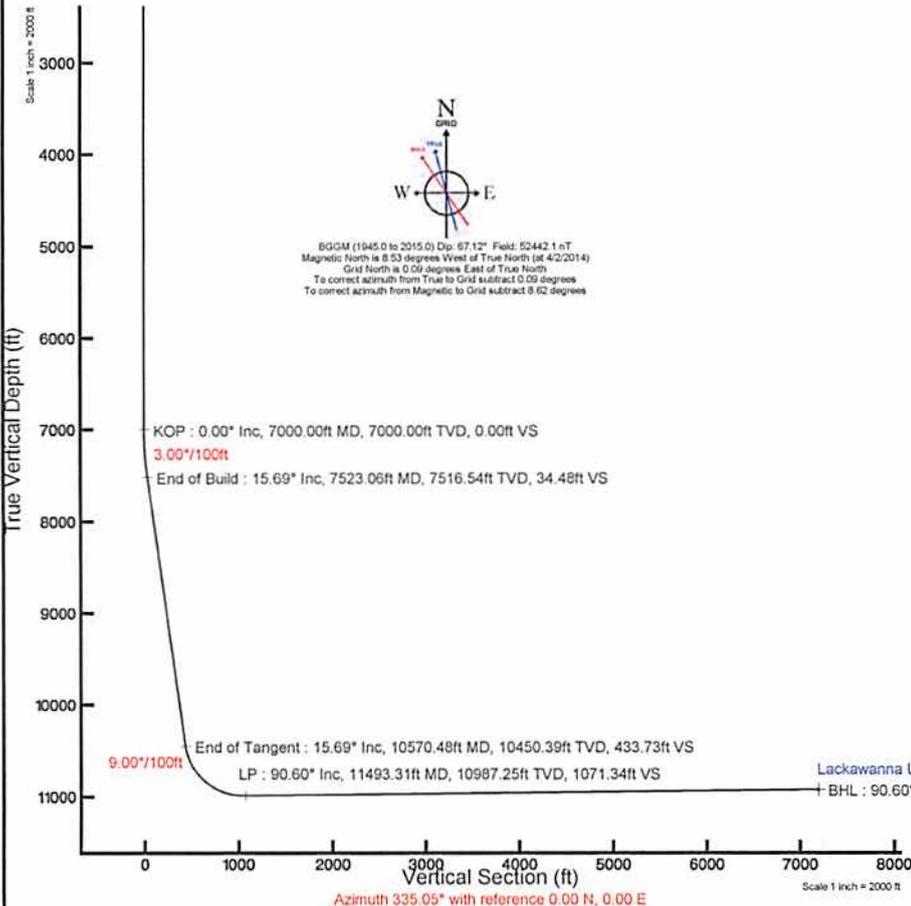
True vertical depths are referenced to Rig on Slot #3 (RT)	Grid System: NAD83 / UTM Zone 17 North, US feet
Measured depths are referenced to Rig on Slot #3 (RT)	North Reference: Grid north
Rig on Slot #3 (RT) to Mean Sea Level: 1315 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot: Slot #3U): -1302 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: frisjesl on 4/16/2014

Location Information

Facility Name	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude		
Lackawanna Unit Pad	1680777.720	14384374.840	39°36'21.34"N	80°51'24.118"W		
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Slot #3U	-39.97	-1.75	1680775.970	14384334.890	39°36'21.34"N	80°51'24.141"W
Comment	Client requested to have Slot #3 & #3U switched on 04.15.14.					
Rig on Slot #3 (RT) to Mud line (At Slot: Slot #3U)					-1302ft	
Mean Sea Level to Mud line (At Slot: Slot #3U)					-1302ft	
Rig on Slot #3 (RT) to Mean Sea Level					1315ft	

Targets

Name	MD (ft)	TVD (ft)	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Lackawanna Unit U-3H BHL Plat	17617.31	10923.12	6910.24	-2203.88	1678672.97	14380242.36	39°37'30.280"N	80°51'52.166"W
Lackawanna Unit U-3H TP		10987.00	774.32	651.51	1681427.22	14384108.90	39°35'29.965"N	80°51'15.801"W



WW-9
(9/13)

4710303006

API Number 47 - _____ - _____
Operator's Well No. U-3H

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Gastar Exploration Inc. OP Code 494487685

Watershed (HUC 10) Outlet Middle Island Creek (Undefined) Quadrangle Porters Falls 7.5'

Elevation 1302' County Wetzel District Magnolia

Do you anticipate using more than 5,000 bbls of water to complete the proposed well work? Yes No

Will a pit be used? Yes No

If so, please describe anticipated pit waste: Fresh water for frac and flow back water

Will a synthetic liner be used in the pit? Yes No If so, what ml.? 60

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection (UIC Permit Number UIC-359, UIC 2D0732540; UIC 2D0732523)
- Reuse (at API Number _____)
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain _____)

*DAH
4-30-14*

Will closed loop system be used? If so, describe: Yes, For Vertical and Horizontal Drilling

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc. Air for vertical / Oil for Horizontal
Note on Vertical *If a pocket of gas is hit. The gas flow will be diverted to the flare and SOBM (that is previously prepared) will be pumped into th well to kill the well if necessary.

-If oil based, what type? Synthetic, petroleum, etc. Synthetic oil base

Additives to be used in drilling medium? Barite for weight

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. All drill cuttings will be disposed of in Wetzel County Landfill (Permit SWF-1021)

-If left in pit and plan to solidify what medium will be used? (cement, lime, sawdust) _____

-Landfill or offsite name/permit number? Wetzel County Landfill (SWF-1021/WV0109185)

I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on August 1, 2005, by the Office of Oil and Gas of the West Virginia Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations of any term or condition of the general permit and/or other applicable law or regulation can lead to enforcement action.

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment.

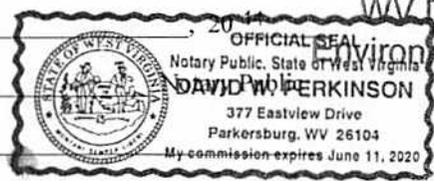
Company Official Signature Michael McCown
Company Official (Typed Name) Michael McCown
Company Official Title Senior VP & COO

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Office of Oil and Gas

MAY 08 2014

Subscribed and sworn before me this 28th day of April

David W. Perkinson



My commission expires 06/11/2020

WV Department of Environmental Protection

4710303006

Form WW-9

Operator's Well No. U-3H

Gastar Exploration Inc.

Proposed Revegetation Treatment: Acres Disturbed 25.45 Prevegetation pH _____

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20

Fertilizer amount 1/3 ton lbs/acre

Mulch 2.5 Tons/acre

Seed Mixtures

Temporary

Permanent

Seed Type	lbs/acre
Annual Ryegrass	40

Seed Type	lbs/acre
Fox Tail / Grassy	40
Perennial Rye	30
Crown Vetch	20

Attach:

Drawing(s) of road, location, pit and proposed area for land application (unless engineered plans including this info have been provided)

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: [Signature]

Comments: _____

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MAY 08 2014

Title: Oil + Gas Inspector

Date: 4-30-14

Field Reviewed? Yes No

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Well Site Safety Plan

Gastar Exploration USA, Inc.

Well Name: Lackawanna U-3H

Pad Location: Lackawanna Pad

Wetzel County, West Virginia

UTM (meters), NAD83, Zone 17:

Northing – 4,384,049.2

Easting – 512,301.5

DMH

4-30-14

Cynthia Raines

5/15/2014

SLR Ref: 1 ~~100534.00008~~ RECEIVED

Office of Oil and Gas

April 2014

MAY 08 2014

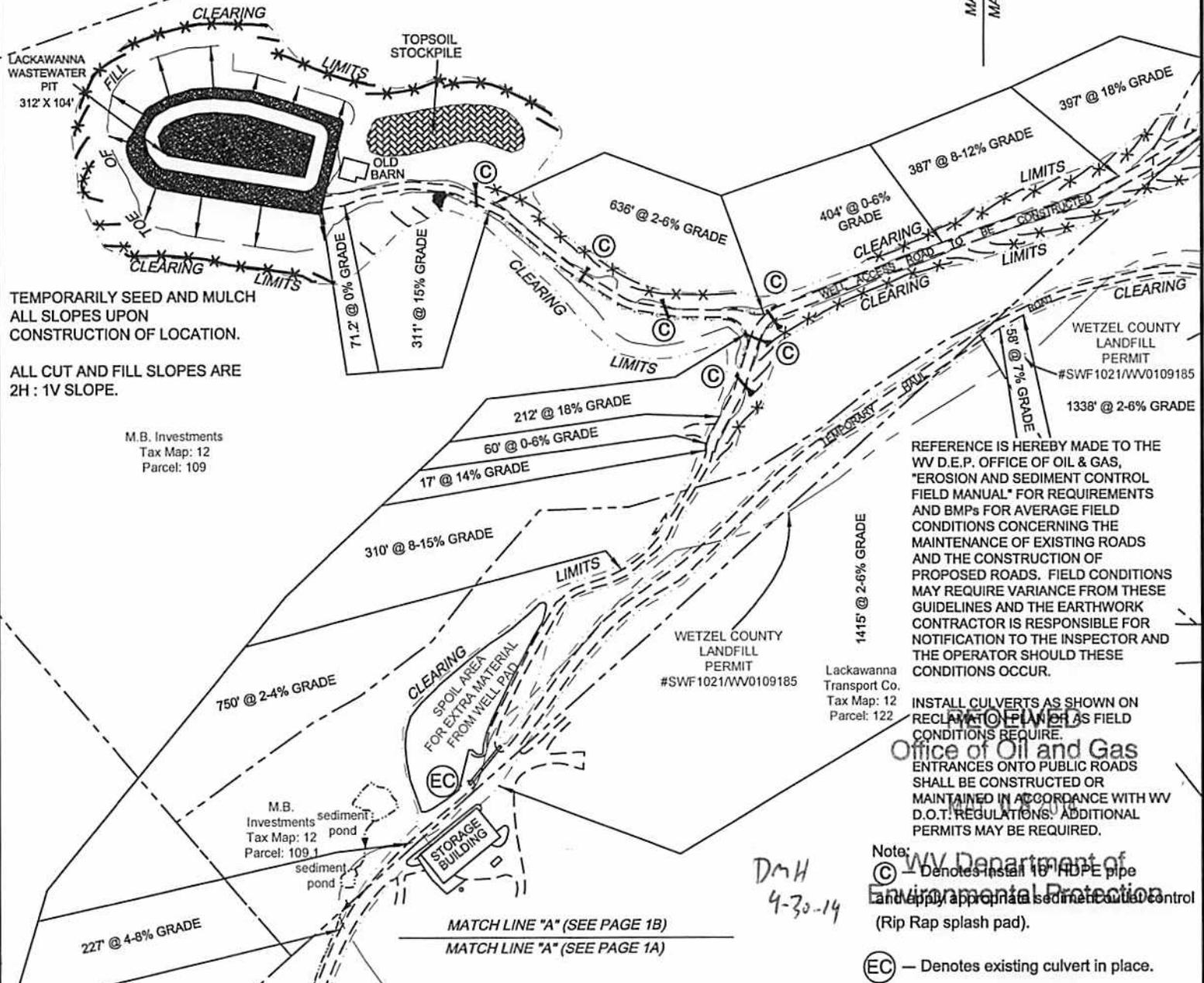
WV Department of
Environmental Protection

ALL TREES 6-INCHES AND ABOVE ARE TO BE CUT AND STACKED. BRUSH SLASHINGS ARE TO UTILIZED DOWN SLOPE OF SITE AND STRUCTURES TO ACT AS A CONTROL BARRIER IF AVAILABLE.



MB Investments
Tax Map: 12
Parcel: 108

M.B. Investments
Tax Map: 12
Parcel: 109



TEMPORARILY SEED AND MULCH ALL SLOPES UPON CONSTRUCTION OF LOCATION.

ALL CUT AND FILL SLOPES ARE 2H : 1V SLOPE.

M.B. Investments
Tax Map: 12
Parcel: 109

REFERENCE IS HEREBY MADE TO THE WV D.E.P. OFFICE OF OIL & GAS, "EROSION AND SEDIMENT CONTROL FIELD MANUAL" FOR REQUIREMENTS AND BMPs FOR AVERAGE FIELD CONDITIONS CONCERNING THE MAINTENANCE OF EXISTING ROADS AND THE CONSTRUCTION OF PROPOSED ROADS. FIELD CONDITIONS MAY REQUIRE VARIANCE FROM THESE GUIDELINES AND THE EARTHWORK CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION TO THE INSPECTOR AND THE OPERATOR SHOULD THESE CONDITIONS OCCUR.

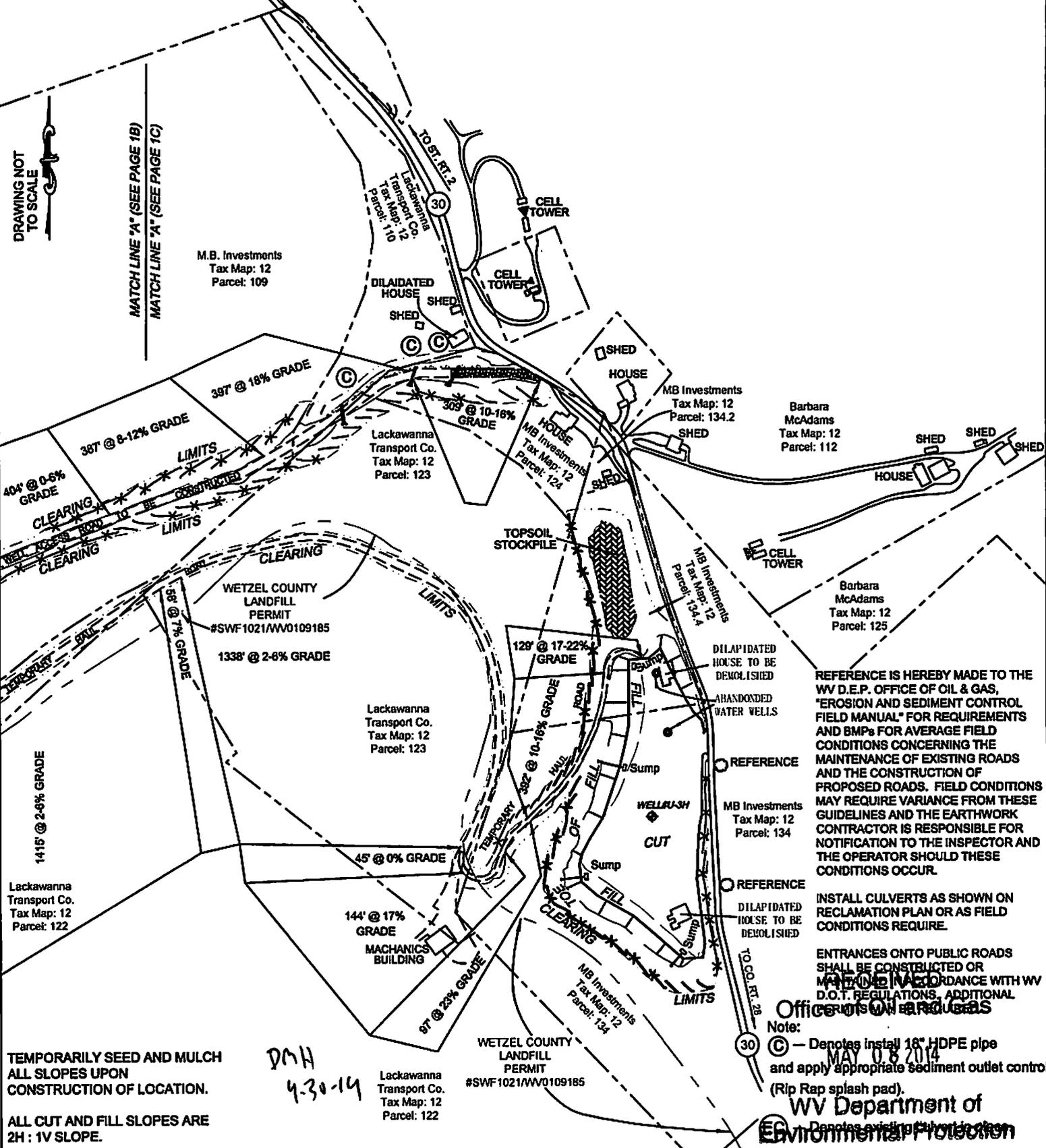
INSTALL CULVERTS AS SHOWN ON RECLAIMATION PLAN. FIELD CONDITIONS REQUIRE. ENTRANCES ONTO PUBLIC ROADS SHALL BE CONSTRUCTED OR MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATIONS. ADDITIONAL PERMITS MAY BE REQUIRED.

Note: © Denotes install 18" HDPE pipe and apply appropriate sediment control (Rip Rap splash pad). (EC) - Denotes existing culvert in place.

-x-x- Silt Fence and or Sediment and Erosion Control Measure.

DMH
4-30-14

ALL TREES 6-INCHES AND ABOVE ARE TO BE CUT AND STACKED. BRUSH SLASHINGS ARE TO UTILIZED DOWN SLOPE OF SITE AND STRUCTURES TO ACT AS A CONTROL BARRIER IF AVAILABLE.



REFERENCE IS HEREBY MADE TO THE WV D.E.P. OFFICE OF OIL & GAS, "EROSION AND SEDIMENT CONTROL FIELD MANUAL" FOR REQUIREMENTS AND BMPs FOR AVERAGE FIELD CONDITIONS CONCERNING THE MAINTENANCE OF EXISTING ROADS AND THE CONSTRUCTION OF PROPOSED ROADS. FIELD CONDITIONS MAY REQUIRE VARIANCE FROM THESE GUIDELINES AND THE EARTHWORK CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION TO THE INSPECTOR AND THE OPERATOR SHOULD THESE CONDITIONS OCCUR.

INSTALL CULVERTS AS SHOWN ON RECLAMATION PLAN OR AS FIELD CONDITIONS REQUIRE.

ENTRANCES ONTO PUBLIC ROADS SHALL BE CONSTRUCTED OR MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATIONS. ADDITIONAL BMPs MAY BE REQUIRED.

Office of Oil and Gas
Note:
© - Denotes install 18" HDPE pipe and apply appropriate sediment outlet control (Rip Rap splash pad).
MAY 08 2014
WV Department of Environmental Protection

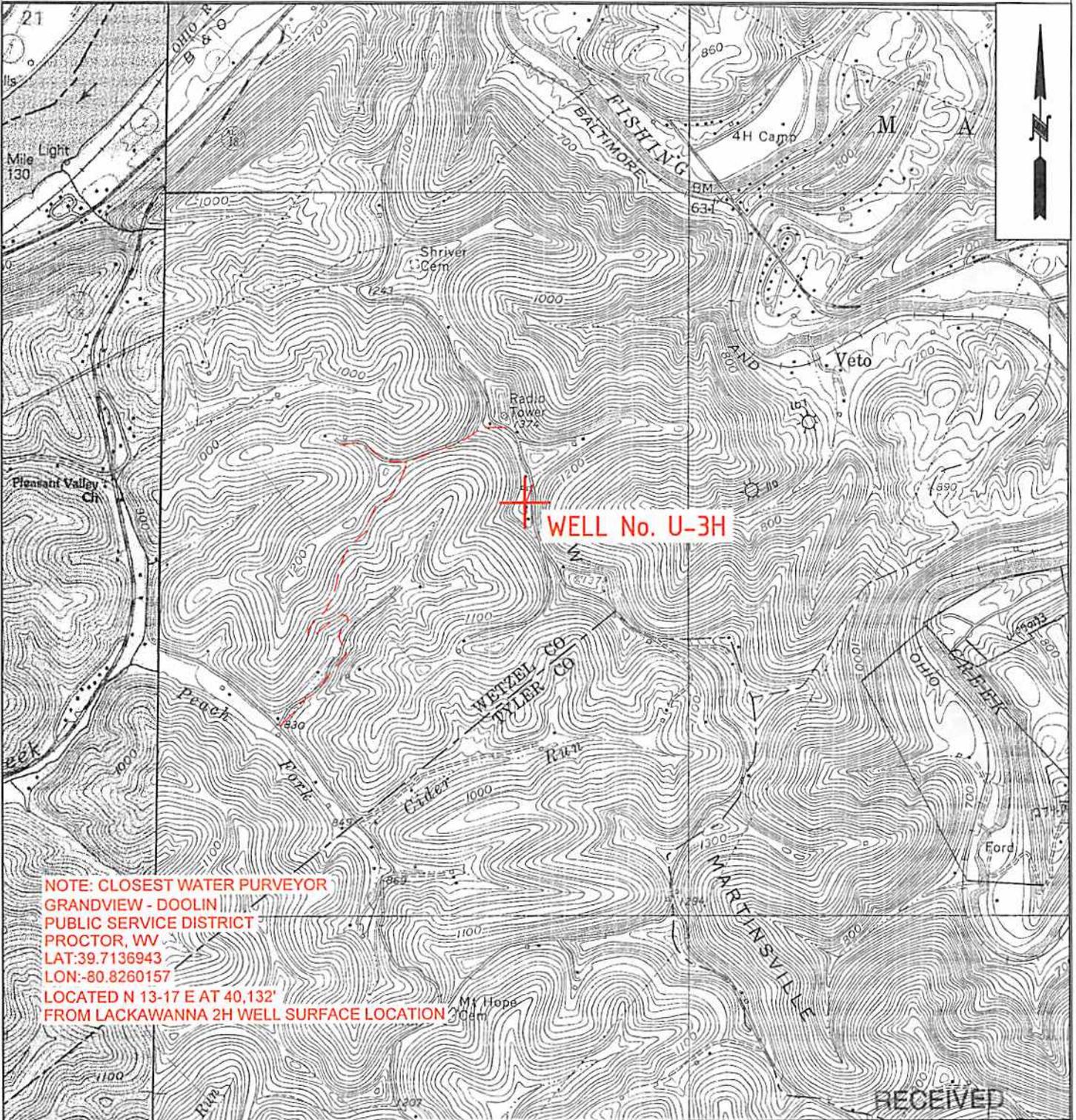
TEMPORARILY SEED AND MULCH ALL SLOPES UPON CONSTRUCTION OF LOCATION.
ALL CUT AND FILL SLOPES ARE 2H : 1V SLOPE.

DMH
4-30-14

WW-9

PROPOSED LACKAWANNA WELL No. U-3H

SUPPLEMENT PG 2



NOTE: CLOSEST WATER PURVEYOR
GRANDVIEW - DOOLIN
PUBLIC SERVICE DISTRICT
PROCTOR, WV
LAT: 39.7136943
LOX: -80.8260157
LOCATED N 13-17 E AT 40.132'
FROM LACKAWANNA 2H WELL SURFACE LOCATION

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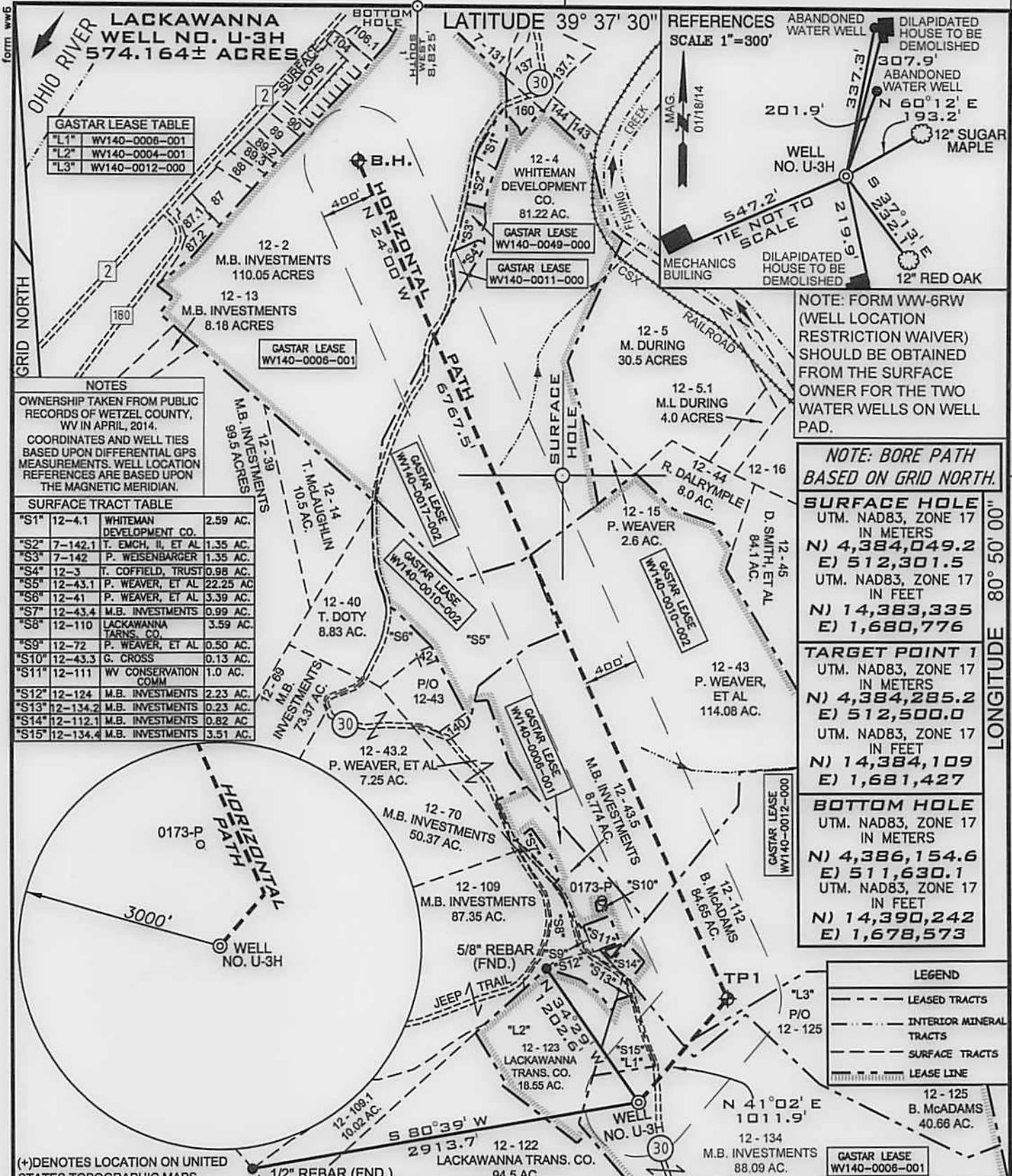
OPERATOR
 GASTAR EXPLORATION Inc.
 229 W Main Street, Suite 301
 Clarksburg, WV 26301

TOPO SECTION
 PORTERS FALLS 7.5'
SCALE:
 1"=2000'

Office of Oil and Gas
LEASE NAME
 LACKAWANNA 4
DATE:

WV Department of
 Environmental Protection
 DATE: 04/21/14

W0110309



NOTE: FORM WVW-6RW (WELL LOCATION RESTRICTION WAIVER) SHOULD BE OBTAINED FROM THE SURFACE OWNER FOR THE TWO WATER WELLS ON WELL PAD.

NOTE: BORE PATH BASED ON GRID NORTH.

SURFACE HOLE
UTM. NAD83, ZONE 17
IN METERS
N) 4,384,049.2
E) 512,301.5
UTM. NAD83, ZONE 17
IN FEET
N) 14,383,335
E) 1,680,776

TARGET POINT 1
UTM. NAD83, ZONE 17
IN METERS
N) 4,384,285.2
E) 512,500.0
UTM. NAD83, ZONE 17
IN FEET
N) 14,384,109
E) 1,681,427

BOTTOM HOLE
UTM. NAD83, ZONE 17
IN METERS
N) 4,386,154.6
E) 511,630.1
UTM. NAD83, ZONE 17
IN FEET
N) 14,390,242
E) 1,678,573

LEGEND

- LEASED TRACTS
- INTERIOR MINERAL TRACTS
- SURFACE TRACTS
- LEASE LINE

12-125 B. McADAMS 40.66 AC.

GASTAR LEASE WV140-0006-001

NOTES
OWNERSHIP TAKEN FROM PUBLIC RECORDS OF WETZEL COUNTY, WV IN APRIL, 2014.
COORDINATES AND WELL TIES BASED UPON DIFFERENTIAL GPS MEASUREMENTS. WELL LOCATION REFERENCES ARE BASED UPON THE MAGNETIC MERIDIAN.

SURFACE TRACT TABLE

TRACT	OWNER	ACRES
S1	12-4.1 WHITEMAN DEVELOPMENT CO.	2.59 AC.
S2	7-142.1 T. EMCH, II, ET AL	1.35 AC.
S3	7-142 P. WEISENBARGER	1.35 AC.
S4	12-3 T. COFFIELD, TRUST	0.98 AC.
S5	12-43.1 P. WEAVER, ET AL	22.25 AC.
S6	12-41 P. WEAVER, ET AL	3.39 AC.
S7	12-43.4 M.B. INVESTMENTS	0.99 AC.
S8	12-110 LACKAWANNA TRANS. CO.	3.59 AC.
S9	12-72 P. WEAVER, ET AL	0.50 AC.
S10	12-43.3 G. CROSS	0.13 AC.
S11	12-111 WV CONSERVATION COMM	1.0 AC.
S12	12-124 M.B. INVESTMENTS	2.23 AC.
S13	12-134.2 M.B. INVESTMENTS	0.23 AC.
S14	12-112.1 M.B. INVESTMENTS	0.82 AC.
S15	12-134.4 M.B. INVESTMENTS	3.51 AC.

FILE NUMBER W0110309
DRAWING NUMBER LACKAWANNA_WP_U-3H_REV1
SCALE 1" = 1000'
MINIMUM DEGREE OF ACCURACY 1/200
PROVEN SOURCE SUBMETER MAPPING
OF ELEVATION GRADE GPS

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION

P.S. Jonathan N. White
2122



WVDEP
OFFICE OF OIL & GAS
601 57TH STREET
CHARLESTON, WV 25304

DATE: APRIL 21, 2014
OPERATORS WELL NO. LACKAWANNA NO. U-3H
API WELL NO. 47-103-03006464

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
(IF "GAS") PRODUCTION STORAGE DEEP SHALLOW
LOCATION ELEVATION 1302' WATERSHED (HUC 10) OUTLET MIDDLE ISLAND CREEK (UNDEFINED)
DISTRICT MAGNOLIA COUNTY WETZEL
QUADRANGLE PORTERS FALLS 7.5' LEASE NUMBER WV140-0017-002, WV140-0049-000, WV140-0011-000, WV140-0006-001, WV140-0010-002, WV140-0012-000, WV140-0004-001
SURFACE OWNER M.B. INVESTMENTS ACREAGE 88.09
OIL & GAS ROYALTY OWNER M.B. INVESTMENTS, ET AL LEASE ACREAGE 574.164
PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE (SPECIFY) _____
PLUG & ABANDON CLEAN OUT & REPLUG
TARGET FORMATION POINT PLEASANT ESTIMATED DEPTH 11,097' + Horizontal Leg
WELL OPERATOR GASTAR EXPLORATION INC. DESIGNATED AGENT MICHAEL McCOWN
ADDRESS 229 W MAIN STREET, SUITE 301 CLARKSBURG WV, 26301 ADDRESS 229 W MAIN STREET, SUITE 301 CLARKSBURG WV, 26301